

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE MAY 2011		2. REPORT TYPE		3. DATES COVERED 00-00-2011 to 00-00-2011	
4. TITLE AND SUBTITLE Intelligence supportability analysis for decision making				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air Force Materiel Command Intelligence Squadron, Wright-Patterson AFB, OH, 45433				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES SPIE Newsroom, Defense & Security, May 20, 2011					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 2	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Intelligence supportability analysis for decision making

Jesse Flanigan

Early identification of non-obvious issues is critical for defining requirements that affect cost, scheduling, performance, and risk in intelligence-gathering systems.

Intelligence gathering is key to providing senior leadership with actionable (i.e., useful) information to support timely, informed decisions. This goes primarily for governments but applies to companies as well. Determining the cost, schedule, and requirements for an intelligence-gathering system often brings into play second- and third-order effects that can be difficult to identify before the fact and may be left out of the overall program budget. An example is a weapon with specific geospatial requirements and data that is not currently available either through commercial or government sources. The program will have to come up with funding for that data as well as pay for the cost of maintaining and updating the information.

To ensure that all of a program's intelligence requirements are documented, acquisition and intelligence experts perform an intelligence supportability analysis (ISA). ISA in one form or another has been around for a long time. But, until now, it was not applied rigorously across programs. Current efforts in the field are focused on systematically incorporating the approach. Here, we describe an ISA evaluation as applied to Department of Defense (DoD) joint intelligence operations to show how best to identify issues early on that could negatively impact the system's ability to produce meaningful results.

The basis of DoD intelligence gathering is a process known as PCPAD (planning and direction, collection, processing and exploitation, analysis and production, and dissemination). PCPAD takes raw collected data and turns it into usable information (see Figure 1). Planning and direction starts by developing a plan to obtain intelligence based on a commander's (in this case a military commander or some other national leader) guidance. The collection step is the physical act of acquiring data. Processing and exploitation converts raw data into usable form. Analysis and production distills the collected data for intelligence value and delivering the desired product. Finally,



Figure 1. The joint intelligence process.¹ Performing intelligence supportability analysis at each step reduces impacts to system cost, scheduling, and performance.

the intelligence information is disseminated to the senior leadership or customer (e.g., national intelligence agencies, foreign governments, or even US corporations).¹

ISA system decomposition breaks down a system into its component parts to accurately identify and account for intelligence support requirements.² In essence, ISA helps determine what kind of 'care and feeding' a new system will require from the intelligence community, just as we plan for spare parts and facilities for physical assets. ISA identifies different risks for each step of the PCPAD process.

All intelligence collection missions begin with planning. For physical surveillance by a flying craft or satellite, this is called mission planning. It includes determining the route of a

Continued on next page

platform (i.e., any type of collection 'asset,' such as an unmanned aerial vehicle or maritime patrol aircraft), the list of planned collection targets, and the requirements for disseminating the data. Maps and charts are used to help design flying routes, and software generates the flight plan. ISA identifies previously undocumented intelligence support requirements, such as accurate geospatial information essential to successful mission planning.

Collection can include basic imagery or signals intelligence data, as well as other more specialized types of information. ISA helps resolve questions of concern to acquisition and intelligence analysts, including requirements and limits for onboard storage of information and transmission needs back to a ground facility. Collection methods may include full-motion video, electro-optical, IR, as well as multispectral- and hyperspectral-imaging sensors. In-depth ISA can help reveal requirements such as whether the system processing is occurring onboard or somewhere else. Because these types of sensors can generate large amounts of data, transmitting it back to analysts in a timely manner is important. How is that happening? Does the bandwidth of the transmission and communication systems support the traffic? Do these platforms only contain optical sensors, or are they interacting with other types of intelligence collectors? Are the personnel charged with analyzing the data properly trained?

A great deal of intelligence support may potentially be required in the processing and exploitation of data after it is collected. ISA helps discern support requirements that are outside the scope of the specific platform or sensors, and that take place after the data is acquired. Analysis concerns include issues of data formats and compatibility, whether the data is transmitted by secure means, and whether file decompression or artifacts need to be addressed. ISA also considers technical issues, such as whether the data was transmitted beyond-line-of-sight (e.g., using satellites) or line-of-sight (i.e., to a receiver within visual range of the collection system) to an exploitation 'node,' such as a mobile station or within the US. Finally, ISA helps evaluate which metadata exists, such as location and position, and whether it is available to the analysts. All of these concerns affect the usability of the data.

Also central to proper analysis of the collected data is having accurate databases and reference materials. ISA evaluates where and how the data is accessed by the analysts, for example, whether up-to-date databases are available, maintained, and have the correct security classification. For image data, ISA helps define what reference graphics and support materials need to be made available, and how they can be accessed and updated. ISA also assesses support intelligence requirements and possible costs that must be accounted for by the acquisition community.

Ultimately, data must be made accessible to customers. ISA-related questions include defining how and when the customer wishes to receive data, whether it is classified, how it is transmitted to the customer, and whether that link is secure. If an accurate estimate of the required bandwidth for all data types entering and leaving the exploitation node is not considered, delays in data transmission can result.

Additional intelligence-related concerns that fall outside of the PCPAD process can also be considered by ISA. For example, coalition operations involve extra effort because the exploitation is not a US-only activity. Missions may require new facilities and have specific long- and short-term data-storage needs. Critical system information must be protected. A detailed ISA will uncover these and other possible intelligence-related costs that may not been accounted for in the overall program budget.

There can also be 'hidden' costs—including securing the collected data—that are often overlooked as an intelligence system is going through development. If costs and requirements are not considered early in the life cycle, then it is possible to spend millions of dollars creating a system that produces data that cannot be processed and is of little intelligence value. Identifying potential issues using ISA is the best way to ensure that a program stays on the projected schedule and within budget while meeting its requirements. For future PCPAD-related programs and projects, we will continue to work to integrate ISA as early as possible to minimize risk to cost, schedule, and performance.

Author Information

Jesse Flanigan

Wright-Patterson Air Force Base
Wright-Patterson AFB, OH

Jesse Flanigan is the director of operations of the Air Force Materiel Command Intelligence Squadron. He has experience as an intelligence analyst, collection manager, and ISR (intelligence, surveillance, and reconnaissance) mission operations commander as well as a space operations officer.

References

1. Joint Chiefs of Staff, *Joint intelligence*, Joint Publication 2-0, 2007.
2. G. Gold et al., *Intelligence supportability in future systems*, *Proc. SPIE* 7818, p. 781802, 2010. doi:10.1117/12.863062